

**VOLUME 3 GENERAL TECHNICAL ADMINISTRATION****CHAPTER 26 AVIATION WEATHER REGULATORY REQUIREMENTS****Section 4 Enhanced Weather Information Systems**

**3-2116 GENERAL.** An Enhanced Weather Information System (EWINS) is a system for gathering, evaluating, and disseminating aviation weather information, and for issuing weather forecasts prepared by properly trained and qualified aviation meteorologists or aircraft dispatchers. An EWINS is optional, however; if an EWINS is used to show compliance with the pertinent regulations, it must satisfy the requirements set out below. In addition, weather forecasts issued through an EWINS must be based on weather reports issued by Federal Aviation Administration (FAA)- and/or National Weather Service (NWS)-approved sources.

**3-2117 SCOPE.** The information contained in this section applies to principal operations inspectors (POI) with oversight responsibility of certificate holders and program managers who conduct operations in accordance with Title 14 of the Code of Federal Regulations (14 CFR) parts 91 subpart K (part 91K), 121, and 135.

**3-2118 ADDITIONAL GUIDANCE.** Information regarding FAA- and NWS-approved sources of weather reports and forecasts is contained in Volume 3, Chapter 26, Section 2.

**3-2119 USING AN EWINS TO SATISFY THE REGULATORY REQUIREMENTS FOR AVIATION WEATHER.** A certificate holder or program manager with an FAA-approved EWINS may use a weather forecast prepared by an EWINS provided that forecast is based on weather reports issued by sources allowable by 14 CFR. The FAA grants approval of an EWINS only to a specific certificate holder or program manager. The FAA does not grant blanket approvals of EWINS to a group of certificate holders or to commercial weather information providers (CWIP) who prepare weather forecasts as part of an EWINS. The vehicle for approval of an EWINS is in the appropriate table (EWINS) of operations specification (OpSpec) A010. Refer to Volume 3, Chapter 18, Section 3 for additional information on A010 authorizations.

**A. Part 91K Program Managers.** POIs of part 91K program managers may grant approval to use an EWINS to satisfy the requirements of part 91, § 91.1039(a), which requires a program manager to use a weather reporting facility operated by the NWS, a source approved by the NWS, or a source approved by the Administrator.

**B. Certificate Holders Conducting Part 121 Domestic and Flag Operations.** POIs of certificate holders who conduct part 121 domestic or flag operations may grant approval to use an EWINS to satisfy the regulatory requirements of part 121, § 121.101, which requires a certificate holder that uses forecasts to control flight movements to use only those forecasts prepared from the weather reports issued by specific sources.

**1) Operations within the 48 Contiguous United States and the District of Columbia.**

a) In accordance with § 121.101(b)(1), a POI may approve a certificate holder conducting domestic or flag operations within the 48 contiguous United States and the District of

Columbia to use a forecast provided by an EWINS if that forecast is prepared from weather reports issued by the NWS or a source approved by the NWS.

b) In accordance with § 121.101(d), a POI may approve a certificate holder conducting domestic or flag operations to use a forecast provided by an EWINS as part of the certificate holder's approved system of obtaining forecasts and reports of adverse weather phenomena. Volume 3, Chapter 26, Section 2 contains information regarding approved sources of forecast and reports of adverse weather phenomena.

## **2) Operations Outside the 48 Contiguous United States and the District of Columbia.**

a) In accordance with § 121.101(b)(2), a POI may approve a certificate holder conducting domestic or flag operations outside of the 48 contiguous United States and the District of Columbia to use a forecast provided by an EWINS if that forecast is prepared from weather reports issued by a source approved by the Administrator. Refer to Volume 3, Chapter 26, Section 2 for approved sources of weather reports.

b) In accordance with § 121.101(d), a POI may approve a certificate holder conducting domestic or flag operations outside of the 48 contiguous United States and the District of Columbia to use a forecast provided by an EWINS as part of the certificate holder's approved system of obtaining forecasts and reports of adverse weather phenomena. Volume 3, Chapter 26, Section 2 contains information regarding approved sources of forecast and reports of adverse weather phenomena.

**C. Certificate Holders Conducting Part 121 Supplemental Operations.** POIs of certificate holders who conduct part 121 supplemental operations may grant approval to use an EWINS to satisfy the requirements of § 121.119, which requires a certificate holder that uses forecasts to control flight movements to use only those forecasts prepared from the weather reports issued by specific sources.

**1) Operations Inside the United States.** In accordance with § 121.119(a), a POI may approve a certificate holder conducting supplemental operations inside the United States to use a forecast provided by an EWINS if that forecast is prepared from weather reports issued by the NWS or a source approved by the Weather Bureau (The Weather Bureau is the NWS. Refer to Volume 3, Chapter 26, Section 1, paragraph 3-2048.)

**2) Operations Outside the United States and at U.S. Military Airports Where No NWS Reports Are Available.** In accordance with § 121.119(a), a POI may approve a certificate holder conducting supplemental operations outside the United States and at U.S. Military airports where no NWS reports are available to use a forecast provided by an EWINS if that forecast is prepared from weather reports issued by a source approved by the Administrator. Refer to Volume 3, Chapter 26, Section 2 for approved sources of weather reports.

**D. Certificate Holders Conducting Part 135 Operations.** POIs of certificate holders who conduct part 135 operations may grant approval to use an EWINS to satisfy the requirements of part 135, § 135.213, which requires a certificate holder to use weather reports and forecasts issued by the NWS, a source approved by the NWS, or a source approved by the

Administrator. A POI may approve a certificate holder conducting part 135 operations to use a forecast provided by an FAA-approved EWINS if that forecast is prepared from reports issued by the approved sources of weather reports listed in Volume 3, Chapter 26, Section 2.

### **3-2120 CHARACTERISTICS OF AN EWINS.**

**A. Basic Requirements.** To ensure an adequate level of reliability, an FAA-approved EWINS must have at a minimum:

- Adequate policies and procedures,
- Trained and qualified personnel,
- Adequate communications and data processing equipment to effectively obtain and analyze weather information,
- Capability to disseminate aviation weather information in an operationally appropriate format, and
- Quality control (QC)/quality assurance (QA) procedures to ensure continued accuracy and adequacy of the forecasts produced by the system.

**B. System Details.** As a condition for initial and continued approval, POIs must ensure that each certificate holder/program manager who has an FAA-approved EWINS, or who is seeking approval for an EWINS, has a detailed description of its policies, procedures, equipment, and personnel that comprise the EWINS contained in its manual system. Any component that comprises the EWINS is subject to FAA approval, therefore, the details of the EWINS as described in a certificate holder's/program manager's manual are subject to FAA approval. If a certificate holder/program manager elects to include its EWINS in a manual that is typically accepted rather than approved by the FAA (e.g., a dispatch or operations manual), the portion of the manual that contains the EWINS is still subject to FAA approval. Certificate holders/program managers who elect to describe the details of their EWINS in a section of an FAA-accepted manual must have a means of distinguishing the section of the manual containing the description of the EWINS as being FAA-approved rather than accepted.

**C. OpSpec/Management Specification (MSpec) Authorization.** In order to authorize a certificate holder/program manager to use an EWINS, POIs must enter the appropriate information in the EWINS table provided in OpSpec/MSpec A010. More detailed guidance on how to issue OpSpec/MSpec A010 is located in Volume 3, Chapter 18, Section 3.

**3-2121 CONTINUED REGULATORY COMPLIANCE.** As previously discussed in this section, a certificate holder/program manager may use an FAA-approved EWINS as a means to comply with certain weather requirements of parts 91K, 121, and 135. However, simply having an EWINS does not automatically satisfy the regulatory requirement to show that weather reports, forecasts, or a combination thereof indicate the weather will be at or above the authorized minimums at the estimated time of arrival (ETA) at the airport or airports to which a flight is being conducted. Volume 3, Chapter 26, Section 1, paragraph 3-2050 generally requires the consideration of any combination of weather reports and forecasts when determining if a destination or alternate airport will be above minimums at the ETA. This means that each certificate holder, pilot in command (PIC), dispatcher, or person authorized to exercise operational control, as applicable, must consider all available weather information pertaining to a

particular airport when making the decision on whether or not to dispatch, release, or continue a flight. Should weather information prepared by an EWINS conflict with the information prepared by another authorized or approved source (e.g., the NWS), each certificate holder/program manager, PIC, dispatcher, or person authorized to exercise operational control, as applicable, must be able to show that the combination of the weather information provided by multiple sources indicates that the weather at the destination or alternate airport will be at or above the authorized minimums at the ETA.

### **3-2122 FAA POLICIES AND EWINS REQUIREMENTS.**

**A. FAA Policy.** The following information sets forth the FAA's policy regarding EWINS.

**1) Products Produced by CWIPs.** A certificate holder/program manager may only use a weather product produced by a CWIP if the certificate holder has an FAA-approved EWINS authorized in OpSpec A010, or if otherwise approved by the Air Transportation Division (AFS-200) (refer to Volume 3, Chapter 26, Section 2, subparagraph 3-2072B and paragraph 3-2074).

NOTE: Using only repackaged weather information (an actual NWS report or forecast that is simply reformatted but not altered in any way) from a CWIP does not require an EWINS. Refer to also Volume 3, Chapter 26, Section 2.

**2) Flight Movement Forecasts (FMF)—Part 121 Domestic and Flag Operations Only.** An FMF is a forecast issued for a single flight by a certificated aircraft dispatcher employed by the certificate holder. A certificate holder may utilize an FMF issued by an aircraft dispatcher under the following conditions.

a) **EWINS Approval.** The FAA has granted the certificate holder authority to use FMFs prepared by an aircraft dispatcher in its FAA-approved EWINS;

b) **The Aircraft Dispatcher Has Adequate Training.** In addition to meeting the training requirements of part 121, the aircraft dispatcher must be adequately trained in accordance with paragraph 3-2124. After successfully completing this training, the aircraft dispatcher is considered to have FMF authority;

c) **The Aircraft Dispatcher Issues the FMF for a Single Flight.** The premise of an FMF is that it is issued by a specifically trained dispatcher who is dispatching a particular flight and has become familiar with the weather conditions along the route of that flight, in accordance with § 121.599;

d) **The Dispatcher Has FMF Authority and Uses Authorized/Approved Sources of Weather Forecasts.** A dispatcher may issue an FMF for a single flight based on a weather forecast issued by the NWS, a source approved by the NWS, or any of the approved sources of weather reports listed in Volume 3, Chapter 26, Section 2; or

e) Airports with No Published Terminal Area Forecast (TAF). If the certificate holder is operating a flight to an airport at which there is no TAF, the dispatcher with FMF authority may issue an FMF for a single flight operating to that airport based on:

- A current area forecast for the area in which the airport is located.
- At least three consecutive weather observations (reports) in the preceding 4 hours, issued by an approved source in accordance with Volume 3, Chapter 26, Section 2.

**3) Continuous Monitoring and Updating.** An FAA-approved EWINS must provide continuous monitoring and updating of weather products.

**4) Recording.** An FAA-approved EWINS must have a method for the certificate holder/program manager to record each forecast prepared by the EWINS.

**5) Dispatch or Flight Release—Part 121.** In accordance with the requirements of §§ 121.687(b) and 121.689(b) (as applicable), a certificate holder conducting part 121 operations who uses forecasts issued by its FAA-approved EWINS must include those forecasts as part of, or attach them to, each dispatch or flight release for which the forecast is applied. These certificate holders must also retain each dispatch or flight release for 3 months in accordance with § 121.695 or § 121.697, as applicable.

**6) Accuracy.** Each FAA-approved EWINS must have a method for certificate holders/program managers to verify the accuracy of forecasts issued in accordance with their approved EWINS. In other words, certificate holders/program managers must be able to verify that what was forecast and what actually occurred generally agree. This can easily be accomplished by comparing actual weather reports issued during the effective period of an EWINS forecast to the forecast itself.

**7) Reporting.** As a condition of initial or continued approval of an EWINS, POIs may require a certificate holder/program manager to submit reports to the certificate-holding district office (CHDO) substantiating the accuracy of the forecasts issued in accordance with its FAA-approved EWINS. POIs will establish the reporting requirements for the certificate holder in writing. POIs will not require a certificate holder/program manager to retain and/or provide substantiation reports beyond the following periods.

- Part 91K operations: No more than 30 days, which is in line with the record keeping requirement of § 91.1027 for the retention of load manifests.
- Part 121 operations: No more than 3 months, which corresponds to requirements of §§ 121.695 and 121.697 to retain dispatch and flight release documents.
- Part 135 operations: No more than 30 days, which is in line with the recordkeeping requirements of § 135.63 for the retention of load manifests.

**8) Individual Approval.** Each certificate holder/program manager must obtain FAA approval and is responsible for its own EWINS.

**9) Training.** Each FAA-approved EWINS must include training for all meteorologists and aircraft dispatchers involved in providing weather information and FMFs. If a CWIP is providing weather information as part of an EWINS, then the EWINS must contain a method whereby a certificate holder/program manager verifies the training of the meteorologists who are employed by the CWIP and produce weather forecasts for the certificate holder. In addition, each FAA-approved EWINS must include training for flightcrews, dispatchers, and persons authorized to exercise operational control on the use and application of the forecasts issued by the EWINS.

**B. EWINS Requirements.** In addition to complying with the policy listed in subparagraph 3-2122A, an EWINS must include descriptions of the structure and operation of the system, as well as provide information concerning the following areas:

**1) Facilities.** Each certificate holder's/program manager's FAA-approved EWINS must list the location of its primary meteorological facility.

**2) Equipment.** Each certificate holder's/program manager's FAA-approved EWINS must describe its communications and data processing equipment.

**3) Weather Sources.** Each certificate holder's/program manager's FAA-approved EWINS must list all sources for aviation weather reports and forecasts, including Supplementary Aviation Weather Reporting System (SAWRS) capabilities, if authorized.

**4) Climatology Information.** Each certificate holder's/program manager's FAA-approved EWINS must have access to seasonal prevailing climatology information (winds, temperature, etc.) for each station/airport at which an EWINS product will be used.

**5) Examples and Limitations.** Each certificate holder's/program manager's FAA-approved EWINS must include examples of all weather products produced by the EWINS, along with the limitations of each product, if any.

**6) Policies and Procedures.** Each certificate holder's/program manager's FAA-approved EWINS must contain policies and procedures for flightcrews, dispatchers, and other persons authorized to exercise operational control on the use of products provided by the EWINS.

**7) Conflicting Forecasts and Prevention of "Forecast Shopping."** If a weather forecast provided by a certificate holder's/program manager's FAA-approved EWINS differs or conflicts with a forecast issued by another FAA- or NWS-approved source, the certificate holder/program manager must show that any combination of weather reports and multiple forecasts indicate that weather will be at or above the authorized minimums at the ETA at the airport in question. Furthermore, if an EWINS provides a forecast of adverse weather phenomena that differs or conflicts with another FAA- or NWS-approved source, the certificate holder/program manager must be able to show that any combination of forecasts and reports of adverse weather phenomena indicate that it is safe for a flight to be dispatched, released, or continued. Each FAA-approved EWINS must contain detailed policies and procedures that contain rationale for dispatchers, flightcrews, and persons authorized to exercise operational control to use when considering multiple forecasts that are available for an airport or area of

airspace. This is necessary to prevent what is commonly known as “forecast shopping” (picking and choosing, or “shopping” for the most advantageous forecast), and to ensure continued compliance with the requirement to consider all available weather reports and forecasts when making a decision on whether or not to dispatch, release, or continue a flight (see also paragraph 3-2121). In the event there is more than one forecast provided by an authorized or approved source for a particular airport or area, certificate holders conducting part 121 operations must retain each forecast as part of any dispatch or flight release issued or amended during the effective time of each forecast. In addition, the certificate holder must be able to demonstrate to the Administrator, upon request, that a choice of one weather product over another for any flight complies with the intent of 14 CFR.

**8) Personnel.** Each certificate holder’s/program manager’s FAA-approved EWINS must contain information regarding the following with respect to personnel.

a) List of Qualified Personnel. Each certificate holder’s/program manager’s EWINS must contain a list of all personnel, along with their qualifications, authorized to create primary weather products.

b) Staffing Requirements. Each certificate holder’s/program manager’s FAA-approved EWINS must contain a description of its staffing requirements.

**9) Documentation and Record Retention.** Part 121 certificate holders must have procedures in place to retain all weather products generated by its FAA-approved EWINS as part of the flight documentation for each flight in accordance with §§ 121.695 and 121.697, as applicable. This includes FMFs and forecasts of adverse weather phenomena along the route of flight. The documentation should include a means to identify whether the forecast is an FMF specific to a particular flight, or a forecast specific to a particular airport or area. The documentation should also include a means to identify the provider of the FMF or forecast as being qualified to provide weather products in accordance with the approved EWINS.

**10) Specific Quality Control Procedures.**

a) Verification of Accuracy. Each certificate holder’s /program manager’s FAA-approved EWINS must have procedures to ensure the accuracy of the products (forecasts) it produces. The procedures must include, but are not limited to:

- Review of actual weather reports as compared to what has been forecast by an EWINS,
- Review of historical reports and forecasts generated by the EWINS, and
- Review of the substantiation reports submitted to the FAA in accordance with subparagraph 3-2122A.

b) Measure the Effectiveness. Each certificate holder’s/program manager’s FAA-approved EWINS must contain procedures to measure the effectiveness of the EWINS’s communication capabilities.

c) Correction of Deficiencies. Each certificate holder's/program manager's FAA-approved EWINS must contain policies and procedures for correcting deficiencies when identified.

### **3-2123 QUALIFICATIONS FOR AVIATION METEOROLOGISTS AND AIRCRAFT DISPATCHERS WITH FMF AUTHORITY.**

**A. Aviation Meteorologists.** Before granting approval to a certificate holder/program manager to use a forecast prepared by an EWINS, POIs will ensure that certificate holders/program managers verify that each aviation meteorologist issuing a forecast (or any other weather information) as part of a certificate holder's/program manager's EWINS meets at least the following criteria:

- Holds a degree in meteorology awarded by an accredited university or college or has officially documented experience as a military weather observer/forecaster;
- Is an employee of the certificate holder or a CWIP approved for use in the certificate holder's FAA-approved EWINS; and
- Successfully completes the initial and any subsequent recurrent training outlined in this section.

**1) Employees of the Certificate Holder.** Each certificate holder/program manager who employs an aviation meteorologist to issue forecast as part of an EWINS must certify that individual as being trained and qualified to perform their duties on behalf of the certificate holder/program manager.

**2) Employees of a CWIP.** Each certificate holder/program manager utilizing primary weather products prepared by a CWIP as part of their EWINS will verify that each aviation meteorologist employed by the CWIP to provide weather information to the certificate holder/program manager satisfies the requirements of subparagraph 3-2123A.

**B. Dispatchers Who Issue FMFs (FMF Authority).** Before granting a certificate holder the authority to use FMFs as part of its FAA-approved EWINS, POIs will verify that aircraft dispatchers with FMF authority meet the following criteria.

- Is a current and qualified aircraft dispatcher for the certificate holder, and
- Successfully completes the training outlined in this section.

**3-2124 TRAINING REQUIREMENTS.** Each certificate holder's/program manager's FAA-approved EWINS must contain training for the key personnel outlined in the subparagraphs that follow. Each training program must include evaluation methods, such as a test, to ensure that individuals gain adequate knowledge of each training subject.

**A. Aviation Meteorologists.** Each training program associated with an EWINS for aviation meteorologists (employees of the certificate holder/program manager and employees of an approved CWIP) who issue forecasts to control flight movements must include at least the following.



- Initial, recurrent, and continuing education;
- The weather requirements of part 91K, 121, or 135, as applicable to the type of operation; and
- A method to evaluate the individual's knowledge and capabilities (e.g., a test).

**1) Initial Training.** Each aviation meteorologist must complete initial training prior to providing weather forecast to the certificate holder/program manager. The number of required training hours will depend upon the complexity of the certificate holder's/program manager's operations and EWINS requirements. Each POI responsible for approving an EWINS must consider these complexities when approving the minimum hours of required instruction. Initial aviation meteorologist training must include at least the following subjects:

a) General Subjects.

- Surface weather reports and analysis.
- Pilot reports.
- Radar weather reports (individual and mosaic).
- Satellite pictures and interpretation.
- Tropopause height and temperature.
- Jet Stream.
- Severe weather outlook charts.
- Upper winds and temperature information.
- Weather depiction charts.
- Freezing level charts.
- Terminal and area forecasts (TAF and FA).
- Collaborative Convective Forecast Product (CCFP).
- Weather advisories (such as convective significant meteorological information (SIGMET), SIGMETs, Airmen's Meteorological Information (AIRMET), and Central Weather Advisories (CWA)).
- Model data to include North American Mesoscale (NAM), Global Forecast System (GFS), and Rapid Update Cycle (RUC) at a minimum.
- Skew-T Analysis.
- Use of Model Output Statistics (MOS) and Localized Aviation MOS Program (LAMP) bulletins.
- Use of advisory or experimental products on the Aviation Weather Center (AWC) and National Centers for Environmental Prediction (NCEP) Web sites.
- Use of climatic data and regimes.
- High-level severe weather information (clear air turbulence).
- Tropical weather forecasting.
- Constant pressure charts (mandatory levels).
- High-level (500–175 millibar (mb)) significant weather prognosis.
- Dynamics of vortices.
- North Polar Region weather.

b) Certificate Holder-Specific Training.

- Prevailing weather associated with the certificate holder's authorized areas of en route operation.
- Types of operations conducted by the certificate holder (e.g., Extended Operations (ETOPS), North Polar, etc.).
- Special Airport requirements.
- Specific requirements of the certificate holder's EWINS.
- Specific communication protocols regarding the dissemination of weather information.

**2) Recurrent Training.** Each aviation meteorologist must successfully complete recurrent training every 12 calendar-months. Recurrent training must include all of the subjects listed in paragraph 3-2124A1). The minimum hours of instruction for recurrent training may be determined by the certificate holder/program manager subject to the approval of the POI.

**3) Continuing Education.** Education and training should be ongoing, as appropriate, and should include a method of informing aviation meteorologists of changes to the certificate holder's/program manager's operations and procedures (e.g., routes, communications, and dissemination methods). Continuing education may also include university courses or seminars sponsored by appropriate professional organizations such as the American Meteorology Society (AMS), National Weather Association (NWA), or Cooperative Program for Operational Meteorology, Education, and Training (COMET).

**B. Aviation Meteorologist Employed by a CWIP.** Aviation meteorologist general subjects training is the responsibility of the CWIP. Certificate holders/program managers utilizing aviation weather products provided by a CWIP must verify that each aviation meteorologist employed by the CWIP has successfully completed all initial and recurrent general subjects training. CWIPs may provide weather information to more than one certificate holder/program manager with an FAA-approved EWINS. Meteorologists employed by these CWIPs do not have to repeat the general subjects training requirements outlined in paragraph 3-2124A for each certificate holder/program manager to whom the CWIP is providing weather information. However, aviation meteorologists employed by a CWIP must complete all initial and recurrent certificate holder (or program manager)-specific training for each certificate holder utilizing the forecasts provided by that CWIP. A CWIP may administer the certificate holder-specific training. However, the responsibility to provide and maintain the certificate holder-specific training belongs to the certificate holder/program manager.

**C. Dispatchers with FMF Authority.** Each training program associated with an EWINS for aircraft dispatchers with FMF authority must include at least the following.

- All training required by part 121 for aircraft dispatchers,
- Policies and procedures regarding the certificate holder's FAA-approved EWINS,
- Initial FMF training, and
- Recurrent FMF training.

**1) Initial and Recurrent FMF Training.** Each dispatcher with FMF authority must complete initial FMF training prior to issuing any FMF on behalf of the certificate holder. The number of required training hours will depend upon the complexity of the certificate holder's operations and EWINS requirements. Each POI responsible for approving an EWINS must consider these complexities when approving the minimum hours of required instruction. FMF training program hours may not be included in the program hours for the regulatory training required by § 121.415, § 121.422, or § 121.427. Initial and recurrent FMF training must include at least the following subjects:

- a) Basic Properties of the Atmosphere.
  - Composition,
  - Density,
  - Measurement,
  - General circulation, and
  - Solar heating.
- b) Clouds.
  - Formation,
  - Condensation,
  - Precipitation,
  - Use of cloud knowledge in forecasting, and
  - Stability and instability.
- c) Air Mass Analysis.
  - Classification,
  - Flying conditions, and
  - Use of air mass knowledge in forecasting.
- d) Analysis of Fronts.
  - Structure and characteristics,
  - Cloud sequences in fronts,
  - Establishing positions of fronts by cloud types,
  - Fronts and seasonal variations,
  - Flying weather in fronts, and
  - Cyclones and anticyclones.
- e) Fog.
  - Types, and
  - Cause and formation.
- f) Ice.

- Types, and
  - Cause and formation.
- g) Thunderstorms, Hurricanes, and Tornadoes.
- Causes,
  - Methods of forecasting, and
  - Structure and complexity of internal winds.
- h) Hail (Cause and Formation).
- i) Wind Shear.
- Detection,
  - Reporting,
  - Cause, and
  - Avoidance technique.
- j) Turbulence.
- Determining the smooth level of flights, and
  - Cause.
- k) Interpreting Weather Data.
- l) Weather Sequences and Symbols.
- Weather map symbols,
  - Drawing a weather map, and
  - Reading a weather map.
- m) Upper-Level Charts.
- n) Adiabatic Charts.
- o) Winds Aloft Charts.
- p) Instruments Used to Gather and Record Weather Data.
- q) Radar Products and Images.
- r) Satellite Products and Images.
- s) Weather Forecasting.
- t) Extrapolation.
- u) Movement of Fronts and Air Masses.

- v) Isobars.
- w) Barometric Tendency.
- x) Use of Advanced Technology in Weather Forecasting Techniques.
- y) Application of Weather Knowledge.
  - Planning,
  - En route
  - Oceanic (if applicable), and
  - North Polar Operations (if applicable).

**2) Recurrent Training.** Each dispatcher with FMF authority must successfully complete recurrent FMF training annually. Recurrent training must include all of the subjects listed in paragraph 3-2124C1).

**D. Flightcrews, Dispatchers, or Persons Authorized to Exercise Operational Control who Utilize EWINS Products.** Each certificate holder/program manager with an FAA-approved EWINS must provide training to flightcrews, dispatchers (part 121 domestic and flag operations), and persons authorized to exercise operational control on how to utilize the products produced by an EWINS. This training may be included in the minimum program hours required by §§ 121.419(b), 121.422(c), and 121.427(c)(1) and (4). Each flightcrew member, dispatcher, or person authorized to exercise operational control must complete initial EWINS training prior to using any primary weather product provided by the EWINS.

**1) Initial EWINS Training.** Initial EWINS training must include, but is not limited to:

- a) Descriptions of each weather product provided by the EWINS;
- b) How to use each weather product provided by the EWINS;
- c) Decisionmaking when confronted with conflicting weather information provided by more than one weather product and selecting the appropriate product or combination of products;
- d) Continued regulatory compliance with the requirement for reports, forecasts, or any combination thereof to indicate that weather will be at or above the authorized minimums at the ETA at the destination and alternate airport (when designated) (refer to paragraph 3-2121); and
- e) Familiarity with the FAA policies and EWINS requirements outlined in paragraph 3-2122.

**2) Recurrent EWINS Training.** The certificate holder/program manager must administer recurrent EWINS training. The training must include all of the subjects listed in paragraph 3-2124D1). Each flightcrew member, dispatcher, or person authorized to exercise

operational control must successfully complete recurrent training at least every 12 calendar-months.

**E. Training Records.** Each certificate holder/program manager with an FAA-approved EWINS must document and maintain a record of the training required by this section.

**1) Aviation Meteorologists.** The certificate holder/program manager must maintain a record of all training and education required by paragraph 3-2124A and B for each aviation meteorologist employed by the certificate holder/program manager and each aviation meteorologist who is employed by a CWIP and issues forecasts to control flight movements for the certificate holder/program manager as part of an EWINS. Certificate holders/program managers must maintain each record of initial training for as long as the aviation meteorologist is employed for the purposes of providing primary weather products to the certificate holder/program manager. The certificate holder/program manager must maintain each record of recurrent training for no less than 1 year.

**2) Dispatchers with FMF Authority.** A certificate holder must maintain a record of all training required by paragraph 3-2124C for each aircraft dispatcher with FMF authority. The certificate holder may maintain a record of this training in combination with the records required by § 121.683. Otherwise, the certificate holder will maintain all records of FMF training in accordance with the requirements applicable to aviation meteorologists outlined in subparagraph 3-2124E1 above.

**3) Flightcrews, Dispatchers, and Persons Authorized to Exercise Operational Control who Utilize EWINS Products.** A certificate holder/program manager must maintain a record of the training required by subparagraph 3-2124D for each flightcrew member, aircraft dispatcher, and person authorized to exercise operational control. If this training is included in the minimum program hours required by §§ 121.419(b), 121.422(c), and 121.427(c)(1) and (4), then the certificate holder must retain the record of the training in accordance with the records required by § 121.683. If this training is administered as a separate training curriculum, then the certificate holder/program manager must maintain a record of the training for no less than 1 year.

**4) Instructor's Certification.** Each instructor who is responsible for administering the training required by this section will certify as to the proficiency and knowledge of the individual being trained upon completion of each training subject. The certificate holder/program manager will include each instructor's certification as part of part of each individual's training record.

### **3-2125 APPROVAL OF AN EWINS.**

**A. Requests for Approval.** POIs of certificate holders/program managers applying for approval to use an EWINS will direct the applicant to make a written request for approval in accordance with Volume 3, Chapter 1, Section 1. The request must describe the proposed EWINS in sufficient detail to allow the POI to evaluate the proposal. The manual containing the proposed EWINS and the resumes of key personnel employed by any CWIP involved in the proposed EWINS must accompany the letter.

**B. Review and Evaluate Proposed EWINS.** Before approving a certificate holder's/program manager's EWINS, POIs must review and evaluate the certificate holder's proposal and any accompanying supporting documentation, and follow the guidance contained in this section as well as the guidance contained in Volume 3, Chapter 18, Section 3. POIs must verify that each proposed EWINS meets the regulatory requirements of 14 CFR, as well as the requirements contained in this section prior to approving the EWINS.

**C. Revision to the EWINS.** Any revisions to a certificate holder's FAA-approved EWINS are subject to approval by the POI. Once approved, the POI will update the EWINS table located in OpSpec/MSpec A010 to reflect the current revision information.

NOTE: POIs of part 121 certificate holders must ensure that an aviation safety inspector (ASI)-aircraft dispatcher (AD) evaluates the certificate holder's EWINS and any subsequent revision. If there is no ASI-AD resource available in the CHDO, the POI should contact the regional Flight Standards division (RFSD) for assistance in locating an ASI-AD within the region. If the RFSD is unable to locate an ASI-AD resource, then the RFSD should request assistance from AFS-200 in locating an ASI-AD or providing the necessary subject matter expertise.

**3-2126 DENIAL OF A PROPOSED EWINS.** If, after review and evaluation, the POI determines that a proposed EWINS does not meet the requirements of 14 CFR and this section, or that he or she is otherwise unsatisfied with the EWINS, the POI will return all submitted materials to the certificate holder/program manager along with a letter outlining the deficiencies of the proposed EWINS.

**3-2127 LACK OF CONTINUED ADEQUACY OF AN EWINS.** If at any time a POI determines that an FAA-approved EWINS does not continue to meet the requirements of 14 CFR and this section, or the POI determines the EWINS is deficient in any way, the POI will immediately inform the certificate holder/program manager. If the certificate holder/program manager does not take immediate and appropriate corrective action, the POI must take action to amend the certificate holder's OpSpec A010, in accordance with 14 CFR part 119, § 119.51, and rescind approval of the certificate holder's/program manager's EWINS.

**RESERVED.** Paragraphs 3-2128 through 3-2140.